

## DECLARATION

In the matter of  
U.S. Serial No. 10/540,944  
in the name of Takao WATANABE

I, the undersigned, Kazuhiko Oshima, of Fujimoto Patent and Law Office, of KA111 Building 5F, 1-1, Kandaawaji-cho 1-chome, Chiyoda-ku, Tokyo, Japan, do solemnly and sincerely declare as follows:

1. That I am well acquainted with the English and Japanese languages and am competent to translate Japanese into English and vice versa.

2. That I have executed, with the best of my ability, true and correct translations to the attached copy of the complete description, claims, drawings and an abstract originally filed as Japanese Patent Application No. 2003-109211.

This 7th day of May, 2009

*Kazuhiko Oshima*  
\_\_\_\_\_  
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[List of Submitted Things]

[Name of Thing]	Specification	1
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[Name of Thing]	Drawings	1
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[NAME OF DOCUMENT]      SPECIFICATION

[TITLE OF THE INVENTION]    THIN DESIGN DISPLAY APPARATUS

[SCOPE OF CLAIM FOR PATENT]

[CLAIM 1]      A thin design display apparatus comprising:

5            a display unit for displaying information;  
            a stand pillar portion for supporting the display unit;  
and

            a joint portion for joining the display unit with the  
stand pillar portion, the joint portion being able to be  
10          inserted to and removed from the stand pillar portion,

            wherein the display apparatus can be used in a first  
usage mode in which the display unit is used by inserting  
the joint portion to the stand pillar portion, and

            wherein the display apparatus can be used in a second  
15          usage mode in which the joint portion is separated from the  
stand pillar portion and used as a stand for supporting the  
display unit.

[CLAIM 2]      The thin design display apparatus according  
to Claim 1, wherein the joint portion has a rotational joint  
20          portion which can rotate so as to control an angle of elevation  
of the display unit.

[CLAIM 3]      The thin design display apparatus according  
to Claim 2, wherein the rotational joint portion projects  
down below a bottom side of the thin design display apparatus  
25          in a state that the rotational joint portion is located

approximately parallel to a display surface of the display unit by rotating.

5 [CLAIM 4] The thin design display apparatus according to Claim 2 or Claim 3, wherein a longitudinal direction of a cross section of the rotational joint portion is an axis direction of a rotation direction of the rotational joint portion.

10 [CLAIM 5] The thin design display apparatus according to Claim 2 or Claim 3, wherein a cross section of the rotational joint portion is circular.

[CLAIM 6] The thin design display apparatus according to any one of Claims 2-5, wherein by rotating the rotational joint portion about the rotational part, the rotational joint portion can be prevented from projecting from an outline of the display apparatus when viewed from a front of the display unit.

20 [CLAIM 7] The thin design display apparatus according to any one of Claims 1-6, wherein the stand pillar portion has a stand pillar which fits the joint portion, and a stand base on which the stand pillar is provided upright,

wherein the stand pillar is rotatable relative to the stand base, and

25 wherein the stand pillar rotates relative to the stand base in accordance with a rotation of the display unit in a horizontal direction.

[CLAIM 8] The thin design display apparatus according to any one of Claims 1-7, wherein the joint portion has a holder for holding a remote controller for remote controlling the display unit.

5 [CLAIM 9] The thin design display apparatus according to any one of Claims 1-8, wherein the joint portion has a fixture portion to be fixed to the display unit and a grip handle positioned above the fixture portion.

[CLAIM 10] The thin design display apparatus according to Claim 9, wherein the grip handle has an annular configuration portion.

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[CLAIM 11] The thin design display apparatus according to Claim 9 or Claim 10, wherein the grip handle has an inclination in which direction the grip handle goes away from the display unit while extending toward a distal end of the grip handle from the fixture portion when viewed from the side of the display unit being stopped.

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[CLAIM 12] The thin design display apparatus according to any one of Claims 9-11, wherein an imaginary plane including a most outer surface of the end portion of the grip handle and a most outer surface of a rotational portion of the rotational joint portion is approximately parallel to a display surface of the display unit.

20

[CLAIM 13] The thin design display apparatus according to any one of Claims 9-12, further comprising a pair of

25

semicircular speaker portions on the left and right of the display unit,

wherein the annular shape of the grip handle is formed similar to the speakers, projecting above the display unit  
5 when viewed from the front of the display.

[CLAIM 14]      The thin design display apparatus according to any one of Claims 1-13, wherein the display apparatus incorporates a battery in a lower side.

[CLAIM 15]      The thin design display apparatus according  
10 to any one of Claims 2-14, wherein the rotational joint portion has an elevation angle restraining means which defines different permissible ranges of an angle of elevation of the display unit between that in the first usage mode and that in the second usage mode.

[CLAIM 16]      The thin design display apparatus according  
15 to any one of Claims 2-15, further comprising an indicating means for informing a user of a fact that the display unit is set at a recommended angle of elevation, based on a rotation of the rotational joint portion.

[CLAIM 17]      The thin design display apparatus according  
20 to any one of Claims 1-16, further comprising an anti separation means for controlling a separation and an anti separation between the stand pillar portion and the joint portion.

[CLAIM 18]      The thin design display apparatus according  
25 to any one of Claims 1-17, further comprising an insertion

direction limiting means for guiding an insertion direction of the joint portion into the stand pillar portion to one way.

5      [CLAIM 19]      The thin design display apparatus according to any one of Claims 1-18, wherein a cushioning member that supports the joint portion in the first usage mode is provided inside the stand pillar portion.

10      [CLAIM 20]      The thin design display apparatus according to any one of Claims 1-19, wherein a free end of the joint portion and its vicinity are formed of a metal material, and wherein a magnet is provided at a position inside the stand pillar portion, that opposites to the metal material the joint portion in the first usage mode.

15      [CLAIM 21]      A thin design display apparatus comprising: a display unit for displaying information; and a rotational joint portion which can rotate so as to control an angle of elevation of the display unit, wherein the rotational joint portion projects down below a bottom side of the thin design display apparatus in a state that the rotational joint portion is located approximately parallel to a display surface of the display unit by rotating.

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[CLAIM 22]      The thin design display apparatus according to Claim 21, further comprising a grip handle for carriage and the like of the thin design display apparatus.

25      [CLAIM 23]      The thin design display apparatus according



to Claim 22, further comprising a fixture portion for fixing the display unit to the rotational joint portion and/or the grip handle,

wherein the fixture portion is formed integrally with  
5 the rotational joint portion and/or the grip handle.

[CLAIM 24] A thin design display apparatus comprising:

a display unit for displaying information;

a rotational joint portion which can rotate so as to control an angle of elevation of the display unit; and  
10 an indicating portion for informing a user of a fact that the display unit is set at a recommended angle of elevation, based on a rotation of the rotational joint portion.

[CLAIM 25] The thin design display apparatus according to Claim 24, further comprising a grip handle for carriage  
15 and the like of the thin design display apparatus.

[CLAIM 26] The thin design display apparatus according to Claim 25, further comprising a fixture portion for fixing the display unit to the rotational joint portion and/or the grip handle,

20 wherein the fixture portion is formed integrally with the rotational joint portion and/or the grip handle.

[CLAIM 27] The thin design display apparatus according to any one of Claims 22, 23, 25 and 26, wherein a display unit upper side portion of the grip handle is formed into  
25 an annular configuration.

[CLAIM 28]      The thin design display apparatus according to any one of Claims 22, 23, and 25-27, wherein the grip handle has an inclination in which direction the grip handle goes away from the display unit while extending toward a distal end of the grip handle from the fixture portion when viewed from the side of the stopping display unit.

[CLAIM 29]      The thin design display apparatus according to any one of Claims 22, 23, and 25-28, wherein an imaginary plane including a most outer surface of the end portion of the grip handle and a most outer surface of a rotational portion of the rotational joint portion is approximately parallel to a display surface of the display unit.

[CLAIM 30]      The thin design display apparatus according to any one of Claims 22, 23, and 25-28, further comprising a pair of semicircular speaker portions on the left and right of the display unit,

wherein the annular shape of the grip handle is formed similar to the speakers, projecting above the display unit when viewed from the front of the display.

[CLAIM 31]      The thin design display apparatus according to any one of Claims 21-23, wherein by rotating the rotational joint portion, the rotational joint portion can be prevented from projecting from an outline of the display apparatus when viewed from a front of the display unit.

[CLAIM 32]      The thin design display apparatus according

to any one of Claims 21-31, wherein the thin design display apparatus incorporates a battery in a lower side.

[CLAIM 33]      The thin design display apparatus according to any one of Claims 21-23, further comprising an indicating means for informing a user of a fact that the display unit is set at a recommended angle of elevation, based on a rotation of the rotational joint portion.

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[Technical Field of the Invention]

The present invention relates to a display apparatus that can be used in various usage modes such that the display is mounted with a stand pillar or without the stand pillar or is used in a wall-mounted position.

[0002]

[Prior Art]

Conventional television using cathode ray tube have been used resting on a TV-mounting rack or case that is able to bear the weight of the television set, in order to support the TV screen at a predetermined height that meets the level and direction of the viewer's viewpoint.

[0003]

Recently the use of thin design televisions using liquid crystal displays, plasma displays and the like has become widespread instead of CRT type displays. In the case of a

CRT television, in order to keep it at a predetermined height, taking into account the ease of watching, it is necessary to use a steady TV-mounting rack, case, table or the like because of its heavy weight. On the other hand, since the  
5 thin design television is provided as a light-weight configuration as it becomes thin, it is possible to use a leg-like stand for supporting the thin design television similar to the stand for a fluorescent lamp, for example, instead of the conventional TV-mounting rack, case, table  
10 and the like. This configuration has the advantage of reducing the area for placement (see the patent literature 1, for example).

[0004]

Also, the development into a thin and lightweight  
15 configuration promotes ease of relocation: for example, a system made up of a battery driven monitor unit and a base unit for transmitting video information to the monitor unit is disclosed in a patent literature 2 and others, in which the battery for driving the monitor unit is chargeable and  
20 the monitor unit can also be used during charging.

[0005]

In this patent literature 2, the monitor unit is constructed such that the battery and a retractable stand are arranged on the backside while a groove with a charging  
25 terminal is formed at the bottom face. Additionally, in the

base unit a charging terminal is formed in a holding rail,  
and when the battery is charged, the monitor unit with the  
stand housed into its stand housing slot is stood against  
the front of the base station so as to bring the charging  
5 terminals into contact with each other to allow for charging  
of the battery.

[0006]

Further, as the stand having a grip handle for carriage,  
a stand similar to that used for an electric fan, for example,  
10 can be used, this also provides the advantage of reducing  
the area of placement.

[0007]

FIGS. 24 to 27 show a conventional stand type thin design  
television (using a liquid crystal display) with a grip handle.  
15 This conventional stand type thin design television comprises  
a main body 101 having a display screen and the like, a stand  
pillar 102, a stand base 103 and a joint body 104.

[0008]

FIG. 25 is a side view showing one step for assembly  
20 of the stand type thin design television, wherein main body  
101 and joint body 104 are integrated with screws etc., and  
stand pillar 102 and stand base 103 are also integrated with  
screws etc., then joint body 104 and stand pillar 102 are  
fitted to each other so that joint body 104 will be fixed  
25 and fastened so as to be rotatable with respect to stand pillar

102.

[0009]

Referring to FIG. 26, the fitting between the joint body 104 and pillar 102 will be described in detail.

5      [0010]

FIG. 26 is a side view showing the parts before these elements are fitted, in particular showing a cutaway representation of the fitting portion. As shown in FIG.26, joint body 104 has a fitting part 105 at the fitting portion while stand pillar 102 has a fitting socket part 106 at the fitting portion. These parts 105 and 106 are attached in an integrated manner to joint body 104 and stand pillar 102, respectively. Fitting part 105 and fitting socket part 106 are formed so as to rotatably engage each other. Fitting part 105 is also formed with a slot 108 that screw fits a bolt 107. Formed at the bottom of fitting socket part 106 is a hole that allows bolt 107 to pass therethrough in the axial direction.

15      [0011]

20      For attachment between joint body 104 and stand pillar 102, fitting part 105 of joint body 104 is fitted first into fitting socket part 106 of stand pillar 102. It should be added that stand pillar 102 and stand base 103 are hollow, forming a connected interior space in these elements. As shown in FIG. 26, bolt 107 is inserted from the bottom of stand

25

base 103, passed through fitting socket part 106 and screwed into slot 108 of fitting metal 105, whereby fitting part 105 and fitting socket part 106 are secured and fixed so as to be rotatable on the same axis. Thus, attachment between joint  
5 body 104 and stand pillar 102 in the above way makes the display screen of main body 101 rotatable and adjustable for horizontally direction with respect to stand pillar 102 while rotation of a rotational axis 104a of joint body 104 makes the display screen of main body 101 adjustable for angle of  
10 elevation.

[0012]

[Patent literature 1]

Japanese Patent Application Laid-open 2002-311852

[Patent literature 2]

15 Japanese Patent Application Laid-open 2002-171461

[0013]

[Problems to be Solved by the Invention]

It is true that the development of thin design televisions into thin and lightweight configurations enables easy carrying  
20 indoors and in other locations, but since, upon practical carriage, the monitor unit described in the patent literature 1 is carried about by grasping the stand portion, or the above-described stand type thin design television with the grip handle is transported by carrying main body 101 to stand  
25 base 103 as a whole, transportation still entails trouble

when the apparatus is transported to a place, for example, the top of a table or the like, where stand pillar 102 is no longer necessary for matching its height to that of viewer's viewpoint or to a narrow mounting space where stand base 103 is a hindrance. Therefore, there have been demands for more versatile thin design televisions, which are less limited by the installation place.

[0014]

In the system of the monitor unit and base unit disclosed in patent literature 2, it is impossible to adjust the angle of the display screen when the monitor is mounted on the base unit, and if an angular adjusting function with respect to the angle of elevation and in the horizontal plane is devised, it needs a complex structure.

[0015]

The present invention has been devised in order to solve the above problems, it is therefore an object of the present invention to provide an easy-to-use thin design display apparatus, whereby its display unit is easily attachable and detachable from the stand structure and can be easily carried about, and the place of installation of the display unit is not limited, the angle of elevation and the horizontal angle of the display screen can be adjusted when the display is set on the stand structure.

[0016]



[Means for Solving the Problems]

In order to achieve the above object, the present invention has the following configurations.

The first aspect of the present invention is  
5 characterized by a display unit for displaying information;  
a stand pillar portion for supporting the display unit; and  
a joint portion for joining the display unit with the stand  
pillar portion, the joint portion being able to be inserted  
to and removed from the stand pillar portion, wherein the  
10 display apparatus can be used in a first usage mode in which  
the display unit is used by inserting the joint portion to  
the stand pillar portion, and wherein the display apparatus  
can be used in a second usage mode in which the joint portion  
is separated from the stand pillar portion and used as a stand  
15 for supporting the display unit.

[0017]

According to the first aspect of the present invention,  
the display apparatus can be used in the first usage mode  
in which the display unit is used by using the stand pillar  
20 portion and in the second usage mode in which the display  
unit is used by separating the joint portion from the stand  
pillar portion. Since the joint portion separated from the  
stand pillar portion in the second usage mode also is usable  
as a supporting stand that is able to control the angle of  
25 elevation of the display unit, the display apparatus can be

set at another location without taking into account the space for the stand pillar portion, hence providing comfort when watching by adjusting the angle with respect to the elevation direction.

5            [0018]

The second aspect of the present invention is characterized in that the joint portion has a rotational joint portion which can rotate so as to control an angle of elevation of the display unit.

10           [0019]

According to the second aspect of the present invention, since having the rotational joint portion which can rotate so as to control an angle of elevation of the display unit, similarly, the display apparatus can be set at another location without taking into account the space for the stand pillar portion, hence providing comfort when watching by adjusting the angle with respect to the elevation direction.

15           [0020]

The third aspect of the present invention is characterized in that the rotational joint portion projects below a bottom of the thin design display apparatus in a state that the rotational joint portion is located approximately parallel to a display surface of the display unit by rotating.

20           [0021]

25           According to the third aspect of the present invention,

since the rotational joint portion is specified to have such a length as to project below the bottom of the thin type display apparatus, the display unit can be stably and securely supported by the rotational joint portion.

5 [0022]

The fourth aspect of the present invention is characterized in that a longitudinal direction of a cross section of the rotational joint portion is an axis direction of a rotation direction of the rotational joint portion.

10 [0023]

According to the fourth aspect of the present invention, since a greater area of the rotational joint portion can be put in contact with the ground, the stability of the display apparatus, especially against the inclination to the left or right, can be enhanced when the display unit is supported by the joint portion.

[0024]

The fifth aspect of the present invention is characterized in that a cross section of the rotational joint portion is circular.

20 [0025]

According to the fifth aspect of the present invention, since the cross section of the rotational joint portion is circular, it is possible to obtain a display turn (sic) function by providing a fitting column slot in the stand pillar portion.

25

[0026]

The sixth aspect of the present invention is characterized in that by rotating the rotational joint portion about the rotational part, the rotational joint portion can be put inside an outline of the display apparatus when viewed from a front of the display unit.

[0027]

According to the sixth aspect of the present invention, when the display unit is used in a wall-mounted position, the display unit can be positioned closer to the wall and the like, and it is possible to avoid the supporting stand being exposed beyond the outer frame of the display unit. Also, it is possible to control of the angle of elevation of the display unit by adjusting the angle of the supporting stand.

[0028]

The seventh aspect of the present invention is characterized in that the stand pillar portion has a stand pillar which fits the joint portion, and a stand base on which the stand pillar is provided upright, wherein the stand pillar is rotatable relative to the stand base, and wherein the stand pillar rotates relative to the stand base in accordance with a rotation of the display unit in a horizontal direction.

[0029]

According to the seventh aspect of the present invention,

even if the longitudinal direction of the cross section of the rotational joint portion is an axis direction of the rotation direction of the rotational joint portion, it is possible to secure the rotation of the display unit with respect to the horizontal direction.

[0030]

The eighth aspect of the present invention is characterized in that the joint portion has a holder for holding a remote controller for remote controlling the display unit.

[0031]

According to the eighth aspect of the present invention, since the holder is arranged on the joint portion, it is possible to prevent the remote controller from being left behind or from being lost even if the display unit is separated from the stand pillar portion and carried freely.

[0032]

The ninth aspect of the present invention is characterized in that the joint portion has a fixture portion to be fixed to the display unit and a grip handle positioned above the fixture portion.

[0033]

According to the ninth aspect of the present invention, since having the grip handle, it is possible to make carriage of the thin design display apparatus easy.

[0034]

The tenth aspect of the present invention is characterized in that the grip handle has an annular configuration portion.

[0035]

5            According to the tenth aspect of the present invention, since an annular configuration of the grip handle engages with a projection, hook or the like stably, the display unit can be used as a stable wall-mounted TV.

[0036]

10           The eleventh aspect of the present invention is characterized in that the grip handle has an inclination in which direction the grip handle goes away from the display unit while extending toward a distal end of the grip handle from the fixture portion when viewed from the side of the  
15           display unit being stopped.

[0037]

            According to the eleventh aspect of the present invention, since the grip handle is formed to go away from the display unit while extending upward, it is possible to make a grip  
20           easy when transporting, and the tolerance also can be given to the length of the projection.

[0038]

            The twelfth aspect of the present invention is characterized in that an imaginary plane including a most  
25           outer surface of the end portion of the grip handle and a

most outer surface of a rotational portion of the rotational joint portion is approximately parallel to a display screen of the display unit.

[0039]

5            According to the twelfth aspect of the present invention, the display screen can be set parallel to a wall surface stably in the wall-mounted state, hence providing stable watching.

[0040]

10           The thirteenth aspect of the present invention is characterized by a pair of semicircular speaker portions on the left and right of the display unit, wherein the annular shape of the grip handle is formed similar to the speakers, projecting above the display unit when viewed from the front of the display.

15           [0041]

            According to the thirteenth aspect of the present invention, since the annular shape of the grip handle is formed similar to the speakers, projecting above the display unit when viewed from the front of the display, it is possible  
20           to provide balance and stylishness from a design viewpoint and also enhance strength by virtue of its curvature.

[0042]

            The fourteenth aspect of the present invention is characterized in that the display apparatus incorporates a  
25           battery in a lower side.

[0043]

According to the fourteenth aspect of the present invention, disposition of a heavy battery at the lower part of display unit enhances the stability of the orientation and placement of display apparatus. Further, it is also convenient in a configuration where the battery is replaced by rotating the unit upside down while the display apparatus is set on the stand pillar. This feature is particularly advantageous when a battery into which battery liquid should be charged, such as a fuel cell is used.

[0044]

The fifteenth aspect of the present invention is characterized in that the rotational joint portion has an elevation angle restraining means which defines different permissible ranges of an angle of elevation of the display unit between that in the first usage mode and that in the second usage mode.

[0045]

According to the fifteenth aspect of the present invention, it is possible to prevent the display unit from being inserted into the stand pillar when the display unit is in an unstable position, providing a guide for safe operation. It is also possible to prevent the display unit in the first usage mode from being inclined to an unstable angle of elevation, hence making it possible to secure the stability of the display



unit in the first usage mode.

[0046]

5      The sixteenth aspect of the present invention is characterized by an indicating means for informing a user of a fact that the display unit is set at a recommended angle of elevation, based on a rotation of the rotational joint portion.

[0047]

10      According to the sixteenth aspect of the present invention, since rotation of the rotational joint portion is left up to the user's operation, if there is a certain stable range for the apparatus and control depending on the range of rotation of the rotational joint portion, for example, when used in the second usage mode or when usage is switched  
15      from the second usage mode to the first usage mode, the user may feel uneasy when operating the rotational joint portion. However, the indicating means is able to inform the user of the recommended stable positions, for example, hence can make the user feel safe and give the user correct operation guidance.

20      [0048]

    The seventeenth aspect of the present invention is characterized by an anti separation means for controlling a separation and an anti separation between the stand pillar portion and the joint portion.

25      [0049]

According to the seventeenth aspect of the present invention, either the carriage of the display unit and the stand pillar portion as a whole as in the first usage mode, or the carriage of the display unit only separated from the stand pillar portion in the first usage mode, can be freely selected, hence it is possible to enhance the flexibility of carrying.

[0050]

The eighteenth aspect of the present invention is characterized by an insertion direction limiting means for guiding an insertion direction of the joint portion into the stand pillar portion to one way.

[0051]

According to the eighteenth aspect of the present invention, it is possible to prevent accidents such as falling over of the apparatus due to loss of balance which would be caused if the joint portion is attached to the stand pillar portion in a wrong direction.

[0052]

The nineteenth aspect of the present invention is characterized in that a cushioning member that supports the joint portion in the first usage mode is provided inside the stand pillar portion.

[0053]

According to the nineteenth aspect of the present

invention, it is possible to prevent backlash of the joint portion in the stand pillar portion.

[0054]

5      The twentieth aspect of the present invention is characterized in that a free end of the joint portion and its vicinity are formed of a metal material, and wherein a magnet is provided at a position inside the stand pillar portion, that opposites to the metal material the joint portion in the first usage mode.

10      [0055]

According to the twentieth aspect of the present invention, in the first usage mode, by attraction force between the metal material and the magnet, it is possible to prevent backlash of the joint portion in the stand pillar portion and to enhance the stability of the display unit relative to the stand pillar portion.

15

[0056]

20      The twenty-first aspect of the present invention is characterized by a display unit for displaying information; and a rotational joint portion which can rotate so as to control an angle of elevation of the display unit, wherein the rotational joint portion projects down below a bottom side of the thin design display apparatus in a state that the rotational joint portion is located approximately parallel to a display surface of the display unit by rotating.

25

[0057]

According to the twenty-first aspect of the present invention, since the rotational joint portion is specified to have such a length as to project below the bottom of the thin type display apparatus, it is possible to support the display in a stable manner by the rotational joint portion.

[0058]

The twenty-second aspect of the present invention is characterized by a grip handle for carriage and the like of the thin design display apparatus.

[0059]

According to the twenty-second aspect of the present invention, it is possible to make carriage easy by providing the grip handle. Since the rotational joint portion is specified to have such a length as to project below the bottom of the thin type display apparatus, it is possible to support the display in a stable manner by the rotational joint portion.

[0060]

The twenty-third aspect of the present invention is characterized by a fixture portion for fixing the display unit to the rotational joint portion and/or the grip handle, wherein the fixture portion is formed integrally with the rotational joint portion and/or the grip handle.

[0061]

According to the twenty-third aspect of the present

invention, since the rotational joint portion and fixture portion; the griphandle and fixture portion; or the rotational joint portion, fixture portion and the grip handle are formed integrally, the assemblage of the thin type display apparatus becomes easy and it is possible to securely support the thin type display apparatus in a stable manner.

[0062]

The twenty-fourth aspect of the present invention is characterized by a display unit for displaying information; a rotational joint portion which can rotate so as to control an angle of elevation of the display unit; and an indicating portion for informing a user of a fact that the display unit is set at a recommended angle of elevation, based on a rotation of the rotational joint portion.

[0063]

According to the twenty-fourth aspect of the present invention, it is possible to provide a user-friendly apparatus such that the indicating means is able inform the user of the appropriate, stable positions free from falling, etc., when the rotational joint portion is rotated, hence it is possible to prevent the apparatus from falling over or being handled forcibly.

[0064]

The twenty-fifth aspect of the present invention is characterized by a grip handle for carriage and the like of

the thin design display apparatus.

[0065]

According to the twenty-fifth aspect of the present invention, it is possible to make carriage easy by providing  
5 the grip handle.

[0066]

The twenty-sixth aspect of the present invention is characterized by a fixture portion for fixing the display unit to the rotational joint portion and/or the grip handle,  
10 wherein the fixture portion is formed integrally with the rotational joint portion and/or the grip handle.

[0067]

According to the twenty-sixth aspect of the present invention, since the rotational joint portion and fixture  
15 portion; the griphandle and fixture portion; or the rotational joint portion, fixture portion and the grip handle are formed integrally, the assemblage of the thin type display apparatus becomes easy and it is possible to securely support the thin type display apparatus in a stable manner.

20 [0068]

The twenty-seventh aspect of the present invention is characterized in that a display unit upper side portion of the grip handle is formed into an annular configuration.

[0069]

25 According to the twenty-seventh aspect of the present

invention, since an annular configuration of the grip handle engages with a projection, hook or the like stably, the display unit can be used as a stable wall-mounted TV.

[0070]

5            The twenty-eighth aspect of the present invention is characterized in that the grip handle has an inclination in which direction the grip handle goes away from the display unit while extending toward a distal end of the grip handle from the fixture portion when viewed from the side of the  
10            stopping display unit.

[0071]

            According to the twenty-eighth aspect of the present invention, since the grip handle is formed to go away from the display unit while extending upward, it is possible to  
15            make a grip easy when transporting, and the tolerance also can be given to the length of the projection.

[0072]

            The twenty-ninth aspect of the present invention is characterized in that an imaginary plane including a most  
20            outer surface of the end portion of the grip handle and a most outer surface of a rotational portion of the rotational joint portion is approximately parallel to a display surface of the display unit.

[0073]

25            According to the twenty-ninth aspect of the present

invention, the display screen can be set parallel to a wall surface stably in the wall-mounted state, hence providing stable watching.

[0074]

5            The thirtieth aspect of the present invention is characterized by a pair of semicircular speaker portions on the left and right of the display unit, wherein the annular shape of the grip handle is formed similar to the speakers, projecting above the display unit when viewed from  
10           the front of the display.

[0075]

            According to the thirtieth aspect of the present invention, since the annular shape of the grip handle is formed similar to the speakers, projecting above the display unit  
15           when viewed from the front of the display, it is possible to provide balance and stylishness from a design viewpoint and also enhance strength by virtue of its curvature.

[0076]

            The thirty-first aspect of the present invention is characterized in that by rotating the rotational joint portion,  
20           the rotational joint portion can be prevented from projecting from an outline of the display apparatus when viewed from a front of the display unit.

[0077]

25           According to the thirty-first aspect of the present



invention, when the display unit is used in a wall-mounted position, the display unit can be positioned closer to the wall and the like, and it is possible to avoid the supporting stand being exposed beyond the outer frame of the display unit. Also, it is possible to control of the angle of elevation of the display unit by adjusting the angle of the supporting stand.

[0078]

The thirty-second aspect of the present invention is characterized in that the thin design display apparatus incorporates a battery in a lower side.

[0079]

According to the thirty-second aspect of the present invention, disposition of a heavy battery at the lower part of display unit enhances the stability of the orientation and placement of display apparatus. Further, it is also convenient in a configuration where the battery is replaced by rotating the unit upside down while the display apparatus is set on the stand pillar. This feature is particularly advantageous when a battery into which battery liquid should be charged, such as a fuel cell is used.

[0080]

The thirty-third aspect of the present invention is characterized by an indicating means for informing a user of a fact that the display unit is set at a recommended angle

of elevation, based on a rotation of the rotational joint portion.

[0081]

According to the thirty-third aspect of the present invention, it is possible to provide a user-friendly apparatus such that the indicating means is able to inform the user of the appropriate, stable positions free from falling, etc., when the rotational joint portion is rotated, hence it is possible to prevent the apparatus from falling over or being handled forcibly.

[0082]

[Embodiment of the Invention]

[The first embodiment]

The first embodiment of the present invention will be described in detail with reference to the drawings.

FIG. 1 is a front view of a stand type thin design television according to the present embodiment. Here, the embodiment is described taking an example of a liquid crystal display as a display unit 1 for displaying information such as video, images and the like. However, various kinds of thin type display devices such as plasma displays, organic EL (electro luminescence) and others can also be employed.

[0083]

The stand type thin design television includes a display unit 1, a joint body 15, a stand pillar 25 and a stand base

29. Joint body 15 is constructed such that it is attached to display unit 1 and also attached detachably to pillar 25 fixed to stand base 29, and in the first usage mode where stand pillar 25 and stand base 29 are used, joint body 15 is fitted into stand pillar 25 so that stand/pillar structure 30 supports display unit 1 while in the second usage mode where stand pillar 25 and stand base 29 are not used, joint body 15 itself is used as a stand.

[0084]

Since joint body 15 and stand pillar 25 can be joined to and separated from each other as above, it is possible to easily change mode between the first and second usage modes. Since joint body 15 is formed so as to be also usable as a stand, switch between the first and second usage modes can be realized with a simple configuration. Next, each component will be described in detail.

[0085]

[Display unit]

To begin with, display unit 1 will be described with reference to FIGS. 1 to 3.

Display unit 1 includes: an approximately rectangular front frame 1a; a liquid crystal display 3 for displaying video, images, etc., in the front frame 1; speakers 5 for sound output; a backside cover 7 (FIG. 2); a TV tuner 9 (FIG. 2) provided inside; a detachable chargeable battery 11 for

power supply (FIG. 2); and a base rail 13 (FIG. 2) formed at the bottom. Display unit 1 can be driven by either battery 11 or an unillustrated a.c., power supply.

[0086]

5           Liquid crystal display 3 is able to display video (including video and image from TV phones) received by TV tuner 9; video and image (including motion pictures, still pictures) recorded on and read out from recording media such as, for example, disk media including DVD, MD, CD, FD and  
10       the like and semiconductor memories; and information such as video, images, text, code, etc., from the internet.

[0087]

Speakers 5 are arranged on both the left and right sides at upper positions of front frame 1a and shaped in semicircular  
15       forms similar to the shape of an aftermentioned handle 17 of joint body 15, which looks arch-like (annular) above front frame 1a, providing balance and stylishness from a design viewpoint and also enhancing strength by virtue of its curvature.

20           [0088]

Battery 11 (FIG. 2) is disposed in the lower part of display unit 1 (at the side closer to stand base 29), is set and unset by opening door 11a provided in the lower part of backside cover 7 as shown in FIG. 3. Disposition of a heavy  
25       part, i.e., battery 11, at the lower part of display unit

1 enhances the stability of the orientation and placement of display unit 1.

[0089]

Base rail 13 functions as a rail for placement of display unit 1 when display unit 1 is separated from stand pillar 25 and stand base 29 and is provided in the bottom face of display unit 1 (on the side close to stand base 29). This can be formed of a material having a non-skid effect, such as rubber, silicone, and the like. The rail is formed in a curved (approximately arced) rail-like (projected) form (having a center on the display unit side 1) with a length that permits appropriate setting even if the angle of elevation of display unit 1 is changed. Base rail 13 can be provided with a predetermined length at the bottom of display unit 1, at one or more places so as to present the above operational effect. When a plurality of rails each having a narrower width are provided in parallel to each other, it is possible to realize the aforementioned operational effect even with a lower amount of material.

[0090]

[Joint body 15]

Next, joint body 15 will be described with reference to FIGS. 1 to 3.

Joint body 15 has a ring-like form, including a grip handle 17, a fixing portion 19 to be fixed to backside cover

7 of the display unit 1, an approximately bar-shaped stand-cum-joint 23, and a first pivot 21 for supporting the stand-cum-joint 23 in a rotatable manner.

[0091]

5           Grip handle 17 has an arched (annular) form having a non-skid member 17a made of non-skid rubber, silicone, and the like formed in an arc on the inner side thereof (FIG. 1).

[0092]

10           Grip handle 17 also plays the roles of a structure that can be engaged with a projection, e.g., a hook 33, formed on a wall 31 etc., as shown in FIG. 6. Since the thickness of first pivot 21 or stand-cum-joint 23 (in the front frame 1a-backside cover 7 direction D) is greater than that of the  
15           fixing portion 19, griphandle 17 is formed obliquely to fixing portion 19 so as to go away from display unit 1 while going away from fixing portion 19, as shown in FIG. 2. More specifically, with respect to the thickness direction D, the position or the depth dimension of the engaging portion (top  
20           part of the arc) of grip handle 17 engaged with hook 31 is formed to be approximately equal to the depth dimension of first pivot 21 or stand-cum-joint 23, whereby grip handle 17 can be positioned closer to wall 31 so that it can be engaged with a hook 31 that is less projected from wall 31 and so  
25           that the display surface of liquid crystal display 3 is set

approximately parallel to the wall 31 face when the display is wall mounted.

[0093]

5      Fixing portion 19 is fixed through backside cover 7 of display unit 1 to the interior chassis by screws.

[0094]

10      First pivot 21 is positioned at a height lower than the midpoint of display unit 1 with respect to the vertical direction H, so as to broaden the angle adjustable range upwards, meeting usage conditions. Also, first pivot 21 holds stand-cum-joint 23 with a strength which keeps the posture of display unit 1 at the set position after a rotation with respect to the direction X of the elevation angle.

[0095]

15      Stand-cum-joint 23 is a structure having a circular cross-section (either solid column or cylinder), including: a rotational part 23a that is rotatably held on first pivot 21, disposed at the proximal end; and a non-skid/cushioning member 23b for skid prevention and cushioning function, formed  
20      of rubber, silicone or the like, at the distal end or at the end opposite to the rotational part 23a.

[0096]

25      As shown in FIG. 2, the longitudinal distance (the distance with respect to the direction from the proximal end to the distal end) of the stand-cum-joint 23 is specified

so that, with the length of stand-cum-joint 23 set parallel to liquid crystal display 3, its distal end is located to extend equal to or beyond the bottom side 1b of front frame 1a of display unit 1. In the present embodiment, the distance to bottom side 1b of front frame 1a of display unit 1 is 113 mm and the projected amount from bottom side 1b is about 19 mm. Accordingly, as shown in FIG. 1 which is the front view of the state of FIG. 2(b), stand-cum-joint 23 has a length extended downwards below the base side 1b of front frame 1a.

[0097]

The reasons for the above configuration are described below:

(1) In a case of a liquid crystal display as a typical example of a thin type display device, referring to the tilt angle, in particular, liquid crystal displays have the viewing angle problem, and the tilt angle needs to be able to deal with all usage situations such as when a viewer may watch the liquid crystal display while sprawled, and other cases. To deal with such situations, when stand-cum-joint 23 is used in the second usage mode, i.e., as the supporting stand for display unit 1, it is significantly important that the length of the supporting stand is specified to project below the bottom side of the display portion when the supporting stand is set approximately parallel to the display unit. This setting of the length of projection permits great flexibility of the



variable angle range.

[0098]

From a viewpoint of installation space, it is necessary to secure a large tilt angle in a narrow space. For this purpose,  
5 it is desired that the joined position of stand-cum-joint 23 is formed at a position as low as possible on the display unit.

[0099]

When the joined position is arranged at a lower position  
10 of the display unit, and when the supporting stand as it is set parallel to the display unit, projects slightly below the bottom side of the display portion, it is possible to obtain a large tilt angle in a narrow space.

[0100]

(2) In a case of a thin type display device, wall-mounting  
15 is one of the features, and for wall-mounting, the display device has the advantage that the longer the supporting stand, the more stably the display is able to be attached.

[0101]

20 [Stand pillar 25 and stand base 29]

Referring next to FIGS. 1 to 5, pillar 25 and stand base 29 will be described.

Stand pillar 25 is a column-like member having a length that permits formation of an insert space 27 enabling the  
25 bar-like portion having a circular cross-section, i.e., the

part of stand-cum-joint 23 other than rotational part 23a, to be inserted and removed, and is fixed upright on stand base 29.

[0102]

5            Insert space 27 is a hole having a circular cross section, and supports stand-cum-joint 23 in a manner that it receives stand-cum-joint 23 therein while non-skid/cushioning member 23b of stand-cum-joint 23 abuts the bottom of insert space 27. The diameter of insert space 27 is specified in such a  
10           size as to permit stand-cum-joint 23 to be freely inserted and removed and leave a clearance that allows stand-cum-joint 23 to rotate about the axis of the longitudinal direction of stand-cum-joint 23.

[0103]

15           Stand base 29 has dimensions that can support display unit 1 at a predetermined height, by means of stand pillar 25 and joint body 15.

[0104]

20           Next, the operationaleffect of the above-described stand type thin design television will be illustrated.

          To begin with, the first usage mode in which pillar 25 and stand base 29 are used is formed by inserting stand-cum-joint 23 of joint body 15 that is fixed to the backside of display unit 1 into insert space 27 of pillar 25, as shown  
25           in (a) to (b) in FIG. 2. Adjustment of the elevation angle

X of display unit 1 in this first usage mode can be made as shown in FIG. 3 by rotating first pivot 21 relative to rotational part 23a of stand-cum-joint 23. Adjustment of the direction of display unit 1 in the horizontal direction Y in this first usage mode, can be made as shown in FIG. 4, by rotating display unit 1 in horizontal direction Y, relative to pillar 25, about the center axis of stand-cum-joint 23, or by rotating stand-cum-joint 23 in insert space 27, about the longitudinal axis thereof.

[0105]

Next, in the second usage mode in which pillar 25 and stand base 29 are not used, stand-cum-joint 23 is used as the stand for supporting display unit 1, stand-cum-joint 23 is pulled out from insert space 27 of stand pillar 25 by holding grip handle 17, for example, as shown in (b) to (a) in FIG. 2, and display unit 1 is supported by base rails 13 arranged on the bottom surface of display unit 1 and non-skid/cushioning member 23b disposed at the distal end of stand-cum-joint 23, as shown in FIG. 5.

[0106]

Since stand-cum-joint 23 is provided to be longer than the bottom side 1b of display unit 1, the angle of elevation X of liquid crystal display 3 (the vertical angle of the orientation of liquid crystal display 3) can be adjusted stably by taking a large distance between base rails 13 and

non-skid/cushioning member 23b when the angle of stand-cum-joint 23 is adjusted relative to liquid crystal display 3.

[0107]

5            As described above, since display unit 1 is supported by base rails 13 provided on the undersurface of display unit 1 and stand-cum-joint 23, the display unit 1 can be installed in a narrow space that affords placement of display unit 1 and stand-cum-joint 23.

10           Also, since the angle of elevation X is adjusted by stand-cum-joint 23, it is possible to adjust the angle of elevation X of display unit 1 with a simple structure and in a limited space.

15           Further, without the necessity of stand pillar 25, the display unit can be easily mounted at the height of a table top, etc., and still the angle of elevation X can be adjusted.

[0108]

20           In addition, when, instead of using stand-cum-joint 23 as a stand, grip handle 17 is used as a mounting attachment to wall 31 as shown in FIG. 6, display unit 1 can be used as a wall-mounted TV. In this case, since grip handle 17 is formed in the arc shape, hook 33 engages the topmost position of the arc, so that display unit 1 can be mounted in a stable position without skew.

25           [0109]

When the display in the state shown in FIG. 2(a) is engaged on hook 33 so as to be used as the wall-mounted TV as shown in FIG. 7, stand-cum-joint 23 may be seen projecting below bottom side 1b of display unit 1. In this case, stand-cum-joint 23 is turned about 180 degrees about pivot 21 as shown in FIG. 8 so that stand-cum-joint 23 will not be projected (exposed) below bottom side 1b, hence preventing the appearance from being marred. Also, when display unit 1 is wall-mounted, it is possible to adjust the angle of elevation of display unit 1 in its wall-mounted state by controlling the amount of rotation of stand-cum-joint 23 about pivot 21.

[0110]

Additionally, since first pivot 21 is positioned at a height lower than the midpoint of display unit 1 with respect to the vertical direction H, stand-cum-joint 23 will not jut out above display unit 1 if stand-cum-joint 23 is turned approximately 180 degrees about pivot 21.

[0111]

In the above description of the stand type thin design television according to the first embodiment, rotation of display unit 1 in horizontal direction Y is achieved by the means of rotating joint body 15 relative to stand pillar 25, however the present invention should not be limited to this. Next, a second embodiment in which display unit 1, joint body

15 and pillar 25 rotate in horizontal direction Y relative to stand base 29 will be described.

[0112]

[The second embodiment]

5            The second embodiment of the present invention will be described hereinbelow in detail with reference to the drawings. Here, the same components as in the above configuration are allotted with the same reference numerals so that their description is omitted while the differences from the above  
10           configuration will be mainly illustrated. Roughly speaking, the differences from the above embodiment reside in that the cross section of the stand-cum-joint is modified from a circle to an approximate rectangle (FIGS. 9 and 14) while the shape of pillar is modified in accordance with the change of the  
15           shape of the stand-cum-joint (FIGS. 9 and 14), that the stand pillar is adapted to be rotatable in the horizontal direction Y relative to the stand base (FIG. 9) and that a remote controller holder for holding a remote controller of display unit 1 is provided for grip handle 17 (FIGS. 15 to 17). The  
20           details will be described hereinbelow.

[0113]

          A stand-cum-joint 35 according to this embodiment includes: a rotational part 35a that is rotatably held on first pivot 21, disposed at the proximal end; and a  
25           non-skid/cushioning member 35b for skid prevention and

cushioning function, formed of rubber, silicone or the like,  
at the distal end or at the end opposite to the rotational  
part 35a, and has a cross section that is long in the direction  
of the rotational axis (direction of the support shaft) of  
5 the first pivot 21, specifically, an approximately rectangular  
cross section, for example.

[0114]

Forming stand-cum-joint 35 so as to have a rectangular  
cross section that is long in the direction of the rotational  
10 axis of first pivot 21 is able to thin the joint body 15 with  
respect to the depth direction D (FIG. 10) while increasing  
the stability of supporting display unit 1 in the second usage  
mode (where the display is separated from the stand pillar).  
Specifically, in the case of stand-cum-joint 23 of the first  
15 embodiment, the contact points with the mounted site in the  
second usage mode will form an approximately triangular shape,  
enclosed by base rails 13 and non-skid/cushioning member 23b.  
On the other hand, in the case of stand-cum-joint 35 of the  
second embodiment, since the non-skid/cushioning member 35b  
20 has a greater dimension in the direction of the rotational  
axis (the longitudinal direction of the bottom of display  
unit 1) of first pivot 21 than that of the non-skid/cushioning  
member 23b, the area enclosed by base rails 13 and  
non-skid/cushioning member 35b forms a tetragon or trapezoidal  
25 shape having a long side defined between base rails 13 and

a short side defined by the width of non-skid/cushioning member 35b. As a result, if both the stand-cum-joints are set at the same inclination with respect to respective display units 1, the stand-cum-joint 35 can create a greater supporting area for display unit 1, hence providing improved stability.

[0115]

As shown in FIGS. 9 and 10, the longitudinal distance (the distance from the proximal end to the distal end) of the stand-cum-joint 35 is specified so that, with the length of stand-cum-joint 35 set parallel to liquid crystal display 3, its distal end is formed to extend equal to or beyond the bottom side 1b of front frame 1a of display unit 1. In the present embodiment, the distance to bottom side 1b of front frame 1a of display unit 1 is 113 mm and the projected amount from bottom side 1b is about 19 mm. Accordingly, as shown in FIG. 9 which is the front view of the state of FIG. 10(b), stand-cum-joint 35 has a length extended downwards below the base side 1b of front frame 1a.

[0116]

A stand pillar 37 of the present embodiment has an elliptic shape in cross section, as shown in FIG. 14 and is formed with an insert space 39 similar to the cross section of stand-cum-joint 35 having an approximately rectangular shape.

[0117]

Insert space 39 is a hollow having an approximately



rectangular cross section, and supports stand-cum-joint 35 in a manner that it receives stand-cum-joint 35 therein while non-skid/cushioning member 35b of stand-cum-joint 35 abuts the bottom of insert space 39. The cross section of insert space 39 is sized so that the stand-cum-joint 35 will be freely inserted to and removed from the insert space without suffering any uncomfortable backlash when it is inserted therein. Accordingly, rotational force acting on display unit 1 in a horizontal direction is transferred to stand pillar 37 by way of joint body 15 and stand-cum-joint 35.

[0118]

In order to enable relative rotation in horizontal direction Y, stand pillar 37 and a stand base 45 are formed with fitting part 41 and fitting socket part 43, similar to fitting part 105 and fitting socket part 106 shown in the prior art, and fitting part 41 and fitting socket part 43 are formed so that they engage each other and are able to rotate relative to each other.

[0119]

Also, a smoother 47 is provided at the bottom of stand pillar 37 on the side of stand base 45 in order to suppress generation of uncomfortable friction sounds and contact damage during its rotation relative to stand base 45. The material of smoother 47 can be selected as appropriate, taking into account the material of stand base 45; for example, plastics,

hard rubber, silicone, and other materials can be used.

[0120]

In the joint portion between stand pillar 37 and stand base 45, in order to realize smooth rotation of stand pillar 37 and in order to suppress generation of uncomfortable fiction sounds and contact damage during the rotation relative to stand base 45, a clearance 49 is formed so as to become greater as it goes away from the rotational center, i.e., fitting part 41 and fitting socket part 43, as shown in FIG. 9. Here, stand base 45 has dimensions that can support display unit 1 at a predetermined height by means of stand pillar 37 and joint body 15.

[0121]

In the present embodiment, a remote controller holder 51 for holding remote controller 53 of display unit 1 is provided for grip handle 17, as shown in FIGS. 15 to 17. Since display unit 1 of this embodiment can be used separated from pillar 37, there is a risk of remote controller 53 being away from display unit 1, which produces inconvenience. Provision of remote controller holder 51 in grip handle 17 that separates from pillar 37 together with display unit 1, makes it possible to move the display unit with remote controller 53 to another location, it is possible to prevent remote controller 53 from being carelessly mislaid or lost. It should be noted that the shape and position of attachment of remote controller

holder 51 are not limited, and it may have any shape, configuration and may be positioned at any place as long as remote controller 53 can be carried together with display unit 1.

5            [0122]

Up to now, the configuration and operational effects have been described by referring mainly to the differences of the configuration in the second embodiment, it goes without saying that the operational effects described in the first  
10        embodiment can be also obtained.

          [0123]

It should be also noted that the above-described stand-cum-joint 35 has an elongated, approximately rectangular cross section, long in the axial direction of  
15        first pivot 21, and it is not limited to the approximately rectangular shape, but stand-cum-joint 35 may have any shape as long as the rotation of stand-cum-joint 35 can be transferred to pillar 37.

          [0124]

20            It also goes without saying that the remote controller holder 51 described in the second embodiment can be applied to the configuration of the first embodiment.

          [0125]

The first and second embodiments are constructed so that  
25        stand-cum-joints 23 and 35 are pulled out from insert spaces

27, 39, respectively. An unillustrated coupling pin for removal prevention of stand-cum-joint 23 or 35 from corresponding insert space 27 or 39 may be provided so as to be inserted into stand-cum-joint 23 or 35 by penetrating through stand pillar 25 or 37. This configuration makes it possible to move display unit 1 as a whole up to stand base 29 or 49, by lifting grip handle 17. However the anti removal means is not limited to insertion of a coupling pin. This will be further detailed next as the third embodiment.

[0126]

[The third embodiment]

Next, the third embodiment of the present invention will be described in detail with reference to the drawings. Here, the same components as in the above configuration are allotted with the same reference numerals so that their description is omitted while the differences from the above second embodiment will be mainly illustrated. Roughly speaking, the differences from the above second embodiment reside in that a hollow 59 for removal prevention and a projection 61 for insert direction restraint are provided for the stand-cum-joint, that the length of the stand-cum-joint is changed to equal to or shorter than that to the bottom side 1b of front frame 1a of display unit 1 when it is set parallel to liquid crystal display 3 (FIGS. 18 and 19), that an anti removal device of the stand-cum-joint is provided for the

stand pillar (FIGS. 18 to 22), that projections 55 are formed in first pivot 21 while the shape of the upper end of the stand pillar is modified in order to limit the angle of elevation of display unit 1 when and after the stand-cum-joint is joined to the pillar (FIGS. 18 and 19), and that an indicating device for recommending the angles of elevation of display unit 1 is provided between first pivot 21 and the stand-cum-joint (FIG. 23). Details are given herein below.

[0127]

[Stand-cum-joint 57]

A stand-cum-joint 57 of this embodiment has an approximately rectangular cross section as of stand-cum-joint 35, but is formed with a length which does not exceed the bottom side 1b (base rail 13) of front frame 1a of display unit 1 (including the equal length) and can at least function as a stand for supporting display unit 1 in the second usage mode. Specifying the length of stand-cum-joint 57 as above puts the center of gravity of display unit 1, in the second usage mode, at a point on the stand-cum-joint 57 side (the backside cover side), whereby it is possible to reliably prevent damage of the delicate display screen because even if an external force toppling display unit 1 acts thereon, the display unit only falls down to the backside cover 7 side.

[0128]

Stand-cum-joint 57 has a hollow 59 (FIG. 18) for

preventing its separation from the joined state to a stand pillar 65 and a restraint projection 61 (FIG. 19) for limiting the direction of its insertion into stand pillar 65 to one way only.

5            [0129]

[Anti-removal device on the stand-cum-joint side]

Anti-removal hollow 59 (FIG. 18) is located on the opposite side of the face opposing display unit 1 when the smoother/cushioning member 35b of stand-cum-joint 57 is  
10            positioned at the bottom side 1b of display unit 1, and formed closer to the free end side (the smoother/cushioning member 35b side) with respect to the length of the stand-cum-joint (rotational part 35a-smoother/cushioning member 35b direction). This anti removal hollow 59 has an approximately  
15            a triangular prism-like shape, long in the width direction of stand-cum-joint 57, and the hollow is formed so that the depth of the hollow becomes greater towards the free end side (the smoother/cushioning member 35b side).

[0130]

20            [Insert limiting device]

Restraint projection 61 (FIG. 19) is provided at the opposite side of anti removal hollow 59 of stand-cum-joint 57, and is a hill-shaped portion or a convex portion, projected in the direction perpendicular to the direction of insertion  
25            of stand-cum-joint 57 into stand pillar 65 (also to be

abbreviated as "direction perpendicular to insertion" in some cases). Restraint projection 61 is one example of the insert limiting device for guiding the insertional direction of stand-cum-joint 57 into stand pillar 65 to only one way, and the present invention should not be limited to the position and configuration of restraint projection 61. When, for example, the insert limiting device is formed with a projection or groove (recess, hollow and cutout), a projection or groove such as the hill shape, convex shape and the like, projected or recessed in the direction perpendicular to insertion may and should be formed at the portion of stand pillar 65 where stand-cum-joint 57 is inserted. Alternatively, without forming any projection or groove, the sectional shape of stand-cum-joint 57, i.e., the shape to be inserted into stand pillar 65 may be formed with a sectional shape, such as a trapezoid, etc., which can limit its insertion to only one way.

[0131]

Thus, provision of the insert limiting device as above makes it possible to prevent loss of balance in the first usage mode due to placement of display unit 1 in an unexpected position or prevent the apparatus from falling over. That is, in order to prevent stand pillar 65 from falling over due to the center of gravity shifting to the display unit 1 side, stand base 45 (FIG. 19) is formed so as to extend

greatly to the display screen side compared to the rearward  
from stand pillar 65. Nevertheless, there is a risk of falling  
if stand-cum-joint 57 is accidentally inserted by turning  
front side back, so the provision of the insert limiting device  
5 undoubtedly eliminates the possibility of such falling.

[0132]

[Rotation restraint structure]

In order to limit the angle of elevation of display unit  
1 when and after coupling between stand pillar 65 and  
10 stand-cum-joint 57, projections 55 are formed on first pivot  
21 (FIGS. 18 and 19).

[0133]

Projections 55 are formed on first pivot 21 along the  
direction of rotation of stand-cum-joint 57. In the present  
15 embodiment, the surface of first pivot 21 where no projection  
55 is formed, is defined approximately semi-circularly,  
equidistant from the center of the rotational axis of  
stand-cum-joint 57 while the portion with projection 55 is  
defined by a longer distance away from the center of the  
20 rotational axis of stand-cum-joint 57 than that in the area  
without projection 55. Thereby, in the state where  
projections 55 interfere with stand pillar 65, the display  
takes an unstable position in which the anti removal device  
does not function correctly, so that the user will be reminded  
25 that the attachment has been done beyond the permissible



position range.

[0134]

Additionally, even in the first usage mode in which the anti removal device functions correctly, if an attempt to tilt the display with respect to the direction of elevation is made toward an imbalanced position, the underside faces 55a of projections 55 interfere and collide with an rear edge 69a (FIG. 19) of a upper face 69 of stand pillar 65, so that a further rotation in the direction of elevation is limited, to thereby prevent imbalance usage in the first usage mode beforehand.

[0135]

Further, the disposition of projections 55 in the area, e.g., first pivot 21, which engages or is close to the upper face 69 of stand pillar 65 and rotates together with display unit 1, makes it possible to put positional restraint when set into the first usage mode and limit forcible rotation of display unit 1 with respect to the direction of elevation in the first usage mode, without limiting the angle of elevation of display unit 1 in the second usage mode. As a result, it is possible to set up the different permissible elevation ranges of the display unit 1 between in those in the first usage mode and those in the second usage mode, hence safe use conditions meeting the usage modes can be secured.

[0136]

It should be understood that as the means for implementing the above restraint, other configurations, in which the distance from the rotational axis of stand-cum-joint 57 to the surface of first pivot 21 is changed (the distance is made longer for the restraint range), can be used; for example, in place of use of projections 55, the surface of first pivot 21 may be formed in an elliptic configuration, etc., to obtain the same operational effects. Here, in the present embodiment, projections 55, or projections 55 and rear edge 69a of stand pillar 65 are formed so that the display may be inclined at a tilt angle of about 10 degrees from the direction perpendicular to the mounted surface of display unit 1.

[0137]

[Grip handle 17b]

In the present embodiment, in order to ease joining and separation between stand pillar 65 and stand-cum-joint 57, grip handle 17b is designed to be less inclined relative to fixing portion 19 than grip handle 17 is. This prevents swaying of display unit 1 when grip handle 17b is held, hence makes it possible to smoothly change the way of usage between the first and second usage modes.

[0138]

[Stand pillar 65]

Roughly speaking, stand pillar 65 differs from stand pillar 37 of the second embodiment, in the shape of the upper

face designated at 69, the shape of an insert space 71, provision of an opening/closing lid 73, an anti removal device 77 of stand-cum-joint 57 and the like (FIGS. 18 to 22).

[0139]

5            Upper face 69 of stand pillar 65 is formed becoming gradually higher from the screen side of display unit 1 toward the backside, so as to mate with the underside of first pivot 21. This configuration is able to reduce the gap between stand pillar 65 and first pivot 21 in the first usage mode and hence  
10           produce in appearance a sense of unity of the separable display unit 1 side and the stand pillar 65 side, making success in design. Additionally, in a case where projections 55 come into contact with upper face 69 when stand-cum-joint 57 is inserted into stand pillar 65, upper face 69 and the  
15           undersurface of first pivot 21 do not mate with each other, forming gaps, which helps the user to recognize occurrence of an improper insertion.

[0140]

            Insert space 71 is a hole into which stand-cum-joint  
20           57 is inserted, and has a shape approximately similar to the sectional shape of stand-cum-joint 57 with restraint projection 61, cut on a plane perpendicular to the direction of insertion (FIG. 20).

[0141]

25           [Interference protector]

Cushioning members 72a and 72b, made up of block-like, bar-like and/or plate-like rubber, plastic, silicone or the like as the interference protectors for keeping a predetermined gap with stand-cum-joint 57 are provided in insert space 71, at positions above the midpoint of the length of insert space 71 or closer to the opening side. Cushioning members 72a and 72b may be provided annularly or partially with respect to the directions perpendicular to insertion. Since stand-cum-joint 57 fitted in insert space 71 is supported inside insert space 71, with the side of its shaft abutted by cushioning members 72a and 72b and the distal end abutted by non-skid/cushioning member 35b, it is possible to reduce uncomfortable shaking of display unit 1 relative to stand pillar 67 and generation of noise due to interference.

[0142]

Further, when the portion, designated at 89, in insert space 71 opposing non-skid/cushioning member 35b of stand-cum-joint 57 or its vicinity is formed of a magnet while the non-skid/cushioning member 35b is formed of metal, the distal end of stand-cum-joint 57 can be attracted to the magnet at the bottom of insert space 71 in the first usage mode, hence it is possible to reduce uncomfortable shaking of stand-cum-joint 57 inside stand pillar 67 and generation of noise due to interference.

[0143]

[Lid member 73]

Opening/closing lid 73 is a lid member that is hinged at its one side by the top inside insert space 71 and is continuously urged in the direction it closes the opening of insert space 71 (FIGS.20 and 21). Since opening/closing lid 73 closes the opening of insert space 71 in the second usage mode, it is possible to avoid entering dirt into insert space 71.

[0144]

10 [Anti-removal device on the stand pillar side]

FIG. 21 is a perspective cutaway view cut along a plane B-B in FIG. 21; FIG. 22 is a perspective view showing the part of an anti removal device 77 in FIG. 21, viewed from the rear side; and FIG. 23 is a perspective view for explaining the operation of anti removal device 77 when an actuator 79 is pressed from the state shown in FIG. 22.

[0145]

As shown in FIG. 21, anti removal device 77 comprises: user actuator 79; a latching/unlatching part 85 which, in the first usage mode, is inserted into and meshed with anti removal hollow 59 (FIG. 18) and comes out from the anti removal hollow 59 by the operation (pressing, for example) of actuator 79 so as to disengage the meshing; a frame 81 for housing actuator 79 and latching/unlatching part 85 and allowing them to reciprocate; and springs 83 and 87 for respectively urging

actuator 79 and latching/unlatching part 85 outwards from the interior of frame 81.

[0146]

5      Actuator 79 has an operating button that is rounded at edges with a concavity at its center in order to produce a greater contact area with a finger so as to disperse its pressing force. The portion, of latching/unlatching part 85, to be inserted into anti removal hollow 59 has an approximately triangular prim-like shape similar to the shape of anti removal  
10      hollow 59. Sliding movement of actuator 79 and that of latching/unlatching part 85 inside frame 81 are approximately perpendicular to each other, so that the directions of urging of springs 83 and 87 are also approximately perpendicular to each other.

15      [0147]

As shown in FIG. 22, one side wall of frame 81 is formed with a first guide slot 81a for guiding actuator 79 in its moving direction and a second guide slot 81b for guiding latching/unlatching part 85 in its moving direction, and a  
20      guide projection 79a of actuator 79 is engaged with the first guide slot 81a and a link rod 85a of latching/unlatching part 85 is engaged with the second guide slot 81b, respectively in a reciprocating manner.

[0148]

25      Actuator 79 has a link slope 79b as an inclined surface

for pressing and moving link rod 85a along second guide slot 81b with the movement of actuator 79.

[0149]

5            In the above arrangement, when grip handle 17b is drawn up with stand-cum-joint 57 coupled with stand pillar 65 (FIG. 21), a first abutment 85c of latching/unlatching part 85 and an opposing, second abutment 59a of anti removal hollow 59 of stand-cum-joint 57 interfere with each other, so that stand pillar 67 and stand base 45 can be lifted together to permit  
10           movement in the first usage mode.

[0150]

          When usage is shifted to the second usage mode, pressing actuator 79 opposing the urging force of spring 83, as shown in FIGS. 22(a) and 22(b), causes link slope 79b to press link  
15           rod 85a while guide projection 79a moves within first guide slot 81a, whereby link rod 85a moves rearwards (in the direction in which latching/unlatching part 85 is pulled out from anti removal hollow 59) within second guide slot 81d, simultaneously, latching/unlatching part 85 having the link  
20           rod 85a moves rearwards opposing spring 87, and latching/unlatching part 85 is withdrawn from anti removal hollow 59. Thus, when grip handle 17b is pulled up while actuator 79 is being pressed, stand-cum-joint 57 is pulled out from stand pillar 67, while first abutment surface 85c  
25           of latching/unlatching part 85 does not interfere with second

abutment surface 59a.

[0151]

[Indicating device]

FIG. 23 shows a sound generator 91 for first pivot 21  
5 (FIG. 18) and rotational part 35a of stand-cum-joint 57, as  
one example of indicating device of recommended angles of  
elevation of display unit 1.

[0152]

Sound generator 91 comprises: a roller 93 that is  
10 rotatably arranged in an long hole 22c (FIG. 23(b)) formed  
in a bearing portion 22 fixed to first pivot 21; a plate-like  
roller receiver 95 having cutouts 94a and 94b to be engaged  
with the roller 93; and an urging means 97 constantly urging  
the roller 93 to the roller receiver 95 side.

15 [0153]

Bearing portion 22 has a fixture face 22a to be fixed  
to first pivot 21 by screws, etc., a flat pivot 22b for axially  
supporting a rotational shaft 36 of rotational part 35a, and  
long hole 22c for rotatably holding roller 93 in the flat  
20 pivot 22b.

[0154]

Long hole 22c is located close to a bearing 22d of  
rotational shaft 36 and opposing cutouts 94a and 94b, and  
loosely holds roller 93 with a proper gap with respect to  
25 its minor axis. Movement of roller 93 in the longitudinal



direction of long hole 22c is limited at one side by bearing  
22d and at the other side by a proximal portion 97a of urging  
means 97. Here, long hole 22c may and should be sized and  
configured so as to at least permit roller 93 to move in the  
5 direction of urging by the urging force of urging mans 97.

[0155]

Roller 93 used here is spherical, but the roller may  
be of a rotatable shape, e.g., cylindrical shape and conical  
shape. Roller 95 is formed of metal, but may be formed of  
10 any material such as metal, resin, etc., taking into account  
the contact sound with roller receiver 95 during rotation,  
and the indication sound when engaged with cutout 94a or 94b.

[0156]

Roller receiver 95 is a plate-like element projected  
15 as a flange from rotational shaft 36 axially supported on  
flat pivot 22b and has annular cutouts 94a and 94b positioned  
equi-distant from the rotational shaft 36. Roller receiver  
95 is formed in a flat plate-like form but may be formed with  
a guide rail for roller 93 at the area where it abuts roller  
20 93. This functions as guide in the moving direction of roller  
93 with respect to roller receiver 95, hence enabling smooth  
rotation. Here, the guide rail may be formed by, for example,  
a groove having a width that can guide roller 93.

[0157]

25 Cutouts 94a and 94b are formed with an opening that will

not permit the roller 93 to pass through, and shaped annularly having a diameter smaller than that of roller 93 in order to enhance the stability of roller 93 fitted therein, and having an effect of centering of roller 93. Further, the opening rims of cutouts 94a and 94b are formed with a curved surface (contact surface) 94c fitting the roller 93, so as to enhance the stability and centering effect of roller 93 meshing cutouts 94a and 94b.

[0158]

Cutout 94a is formed at such a position as to oppose roller 93 when, in switching usage from the second usage mode to the first usage mode, stand-cum-joint 57 is set at a recommended angle for joining itself to stand pillar 65, or set approximately parallel (at an angle of about 0 degree) relative to display unit 1. Cutout 94b is formed at such a position as to oppose roller 93 when, in the second usage mode, display unit 1 is set at a recommended angle, e.g., the display screen of display unit 1 is tilted at about 15 degrees relative to the direction perpendicular to the mounted surface. It should be noted that the number and positions of cutouts are not limited to the above configuration, it is possible to select any positions depending on the events which should be indicated to the user as recommended angles.

[0159]

Urging means 97 constantly urges roller 93 toward the

roller receiver 95 side, and is fixed at proximal portion 97a to flat pivot 22b on its roller receiver 95 side with screws and turned back in a U-shape at the edge of flat pivot 22b so that the flat surface 97b in the vicinity of the free  
5      end presses roller 93 against roller receiver 95 with a predetermined urging force.

[0160]

In the above arrangement, as stand-cum-joint 57 is pivoted from the state where roller 93 is engaged with cutout  
10      94a, rotational shaft 36 and roller receiver 95 rotate together opposing the urging force acting on roller 93 from urging means 97 and the centering force acting between roller 93 and cutout 94a, and roller 93 rolls on the flat surface of roller receiver 95. As roller 93 rolls, and when it fits and  
15      becomes engaged with curved surface 94c of cutout 94b, an indication sound or "click" indicating a recommended angle arises from the urging force from urging means 97 and the centering force between roller 93 and cutout 94b. Thus, the user is given notice of a recommended angle, hence is able  
20      to comprehend safe usage positions. This results in a user-friendly apparatus. Similarly, in the case of rotation from cutout 94b to cutout 94a, the user is able to know the angle of stand-cum-joint 57 to be inserted into stand pillar 65 from the indication sound or "click" indicating a  
25      recommended angle, hence recognize the fact of safe set

position.

[0161]

Here, urging means 97 is not limited to a leaf spring, but an elastic member, e.g., rubber, which continuously  
5 presses roller 93 against roller receiver 95 may be used.

Additionally, the indicating device here was described by taking a configuration that aurally informs the user of a recommended angle, for example, sound generator 93, but it should not be limited to this configuration as long as  
10 it can produce a sound with change of the angle. It is also possible to obtain the same effect by informing the user of the recommended angle with a visual method using, for example, light emitting devices, light-emitting members, instead of indication sound.

15 It also goes without saying that the same operational effects can be obtained by applying the third embodiment to the configuration of the first embodiment.

[0162]

[Advantage of the Invention]

20 As has been described heretofore, according to the present invention, without limitation of the mounting space, the display unit can be efficiently used in various usage modes such that the display may be mounted in a narrow place or moved to a table top or wall-mounted, thus it is possible  
25 to provide a highly versatile display apparatus.

[BRIEF DESCRIPTION OF THE DRAWINGS]

[Fig.1]

FIG. 1 is a front view showing the first usage mode of  
a stand type thin design television according to the first  
5 embodiment of the present invention.

[Fig.2]

FIG. 2 is a side view of the stand type thin design  
television according to the first embodiment of the present  
invention, (a) showing a state where a display unit 1 is  
10 separated from a stand pillar 25, (b) showing a state where  
display unit 1 and stand pillar 25 are joined.

[Fig.3]

FIG. 3 is a perspective operational illustrative view  
showing the backside of the stand type thin design television  
15 according to the first embodiment of the present invention.

[Fig.4]

FIG. 4 is a top operational illustrative view of the  
stand type thin design television according to the first  
embodiment of the present invention.

20 [Fig.5]

FIG. 5 is a perspective view showing the second usage  
mode of the stand type thin design television according to  
the first embodiment of the present invention.

[Fig.6]

25 FIG. 6 is a perspective view of the stand type thin design

television when display unit 1 is wall mounted, according to the first embodiment of the present invention.

[Fig.7]

FIG. 7 is a front view of the stand type thin design television when display unit 1 is wall mounted, according to the first embodiment of the present invention.

[Fig.8]

FIG. 8 is an operational illustrative view showing a stand-cum-joint 23 of the stand type thin design television according to the first embodiment of the present invention.

[Fig.9]

FIG. 9 is a front view showing the first usage mode of a stand type thin design television, in a partially cutaway representation, according to the second embodiment of the present invention.

[Fig.10]

FIG. 10 is a side view of the stand type thin design television according to the second embodiment of the present invention, (a) showing a state where a display unit 1 is separated from a pillar 37, (b) showing a state where display unit 1 and pillar 37 are joined.

[Fig.11]

FIG. 11 is a perspective operational illustrative view showing the backside of the stand type thin design television according to the second embodiment of the present invention.

[Fig.12]

FIG. 12 is an operational illustrative view showing a state where the display unit 1 of FIG. 11 is tilted with respect to the direction X of the angle of elevation.

5      [Fig.12]

FIG. 13 is a top operational illustrative view of the stand type thin design television according to the second embodiment of the present invention.

[Fig.14]

10      FIG. 14 is a perspective view showing the second usage mode of the stand type thin design television according to the second embodiment of the present invention.

[Fig.15]

15      FIG. 15 is a front view showing a remote controller holder 51 for holding a remote controller 53 according to the second embodiment of the present invention.

[Fig.16]

FIG. 16 is a sectional view cut on a plane A-A in FIG. 15.

20      [Fig.17]

FIG. 17 is a schematic side view of FIG. 15.

[Fig.18]

25      FIG. 18 is a backside perspective view of a stand type thin design television according to the third embodiment of the present invention.

[Fig.19]

FIG. 19 is a side view showing the stand type thin design television according to the third embodiment of the present invention.

5      [Fig.20]

FIG. 20 is a perspective view for explaining the second usage mode of a stand type thin design television according to the third embodiment of the present invention.

[Fig.21]

10      FIG. 21 is a perspective cutaway view cut along a plane B-B in FIG. 20.

[Fig.22]

FIG. 22 is a perspective backside view of FIG. 21.

[Fig.23]

15      FIG. 23 is a view of a sound generator 93 of a display unit 1, (a) a side view and (b) a sectional view cut along a plane C-C.

[Fig.24]

20      FIG. 24 is a front view showing a conventional stand type thin design television.

[Fig.25]

FIG. 25 is an illustrative view showing the assembly of a conventional stand type thin design television.

[Fig.26]

25      FIG. 26 is an illustrative view showing the assembly



of a conventional stand type thin design television.

[Fig.27]

FIG. 27 is a side view of a conventional stand type thin design television.

5      [DESCRIPTION OF REFERENCE NUMERALS]

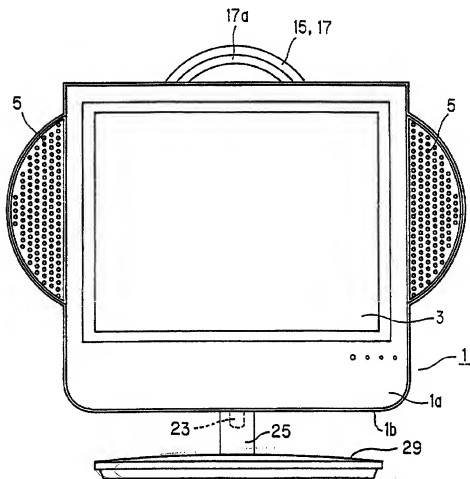
- 1      display unit
- 1a     front frame
- 1b     bottom side
- 3      liquid crystal display
- 10     15     joint body
- 17, 17b   grip handle
- 21     first pivot
- 23, 35, 57      stand-cum-joint
- 25, 37, 65      stand pillar
- 15     29, 45      stand base
- 33     hook
- 35a    rotational part
- 51     remote controller holder
- 53     remote controller
- 20     X      direction of the elevation angle
- Y      rotational direction in horizontal direction
- 55     projection
- 59     hollow for removal prevention
- 61     restraint projection
- 25     77     anti removal device

72a, 72b    cushioning member

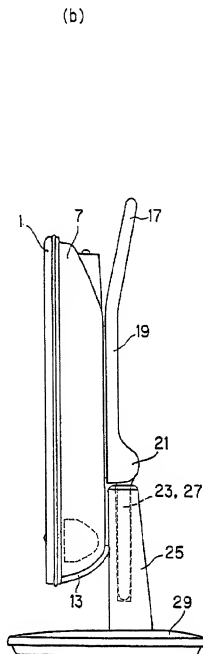
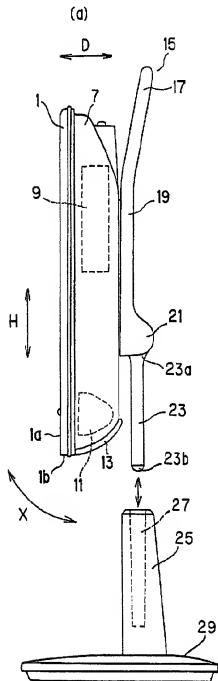
91        sound generator

[NAME OF DOCUMENT] DRAWINGS

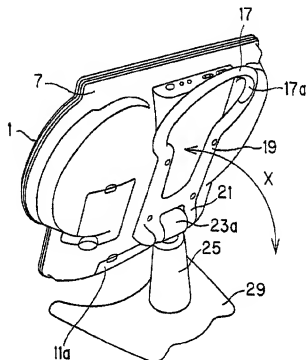
[Fig. 1]



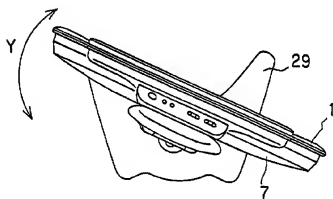
[Fig. 2]



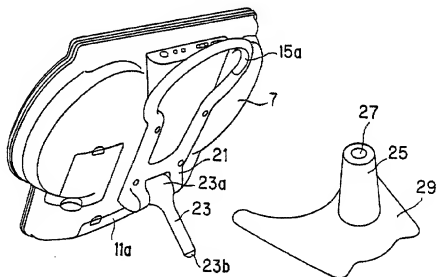
[Fig. 3]



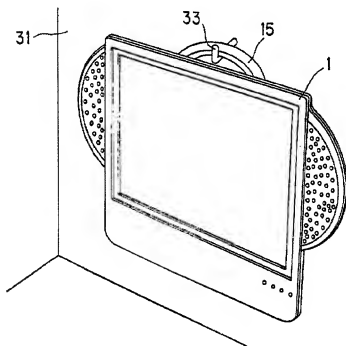
[Fig. 4]



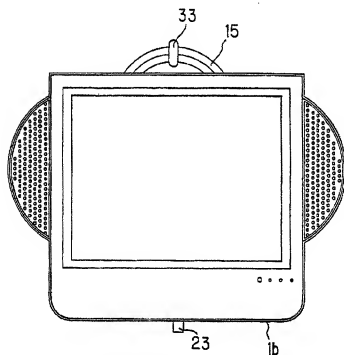
[Fig. 5]



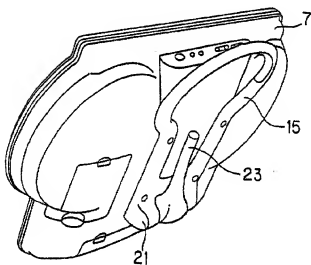
[Fig. 6]



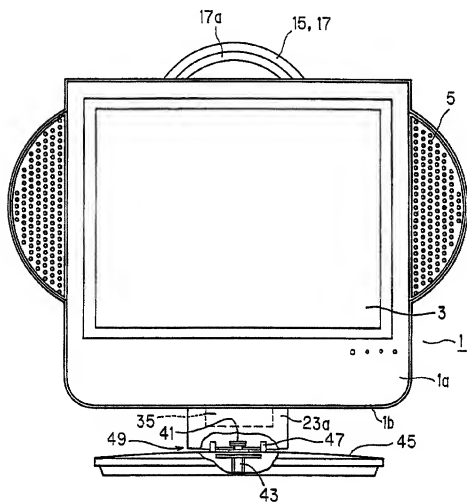
[Fig. 7]



[Fig. 8]

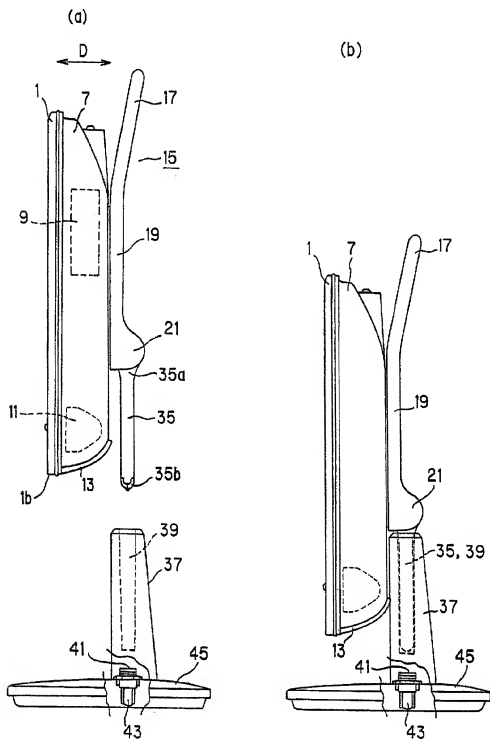


[Fig. 9]

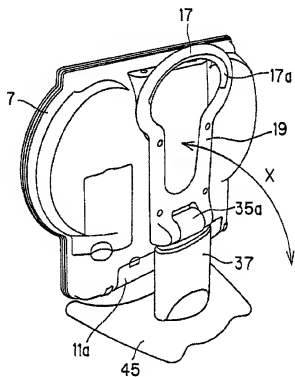




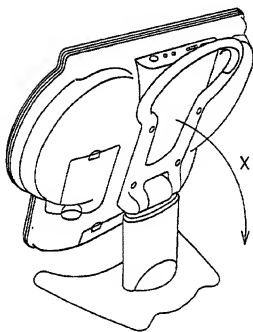
[Fig. 10]



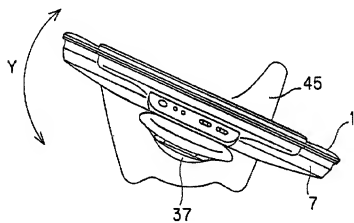
[Fig. 11]



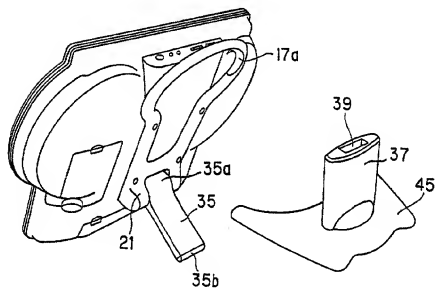
[Fig. 12]



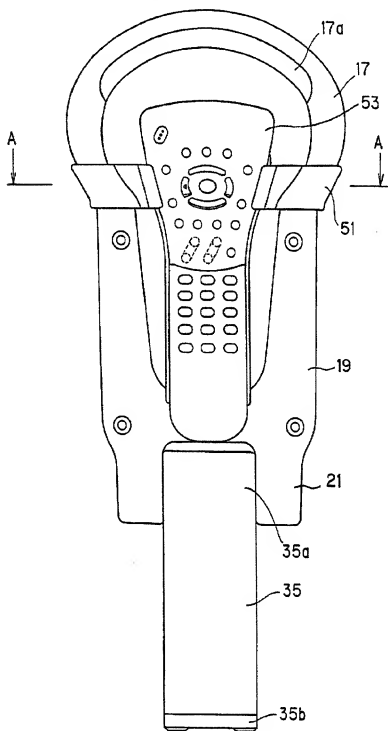
[Fig. 13]



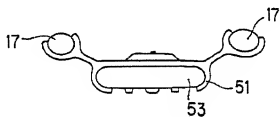
[Fig. 14]



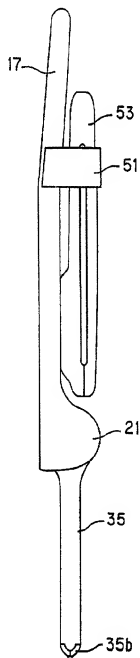
[Fig. 15]



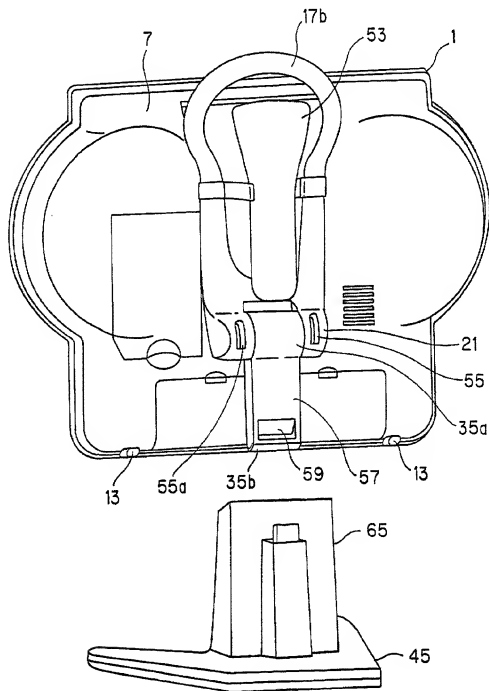
[Fig. 16]



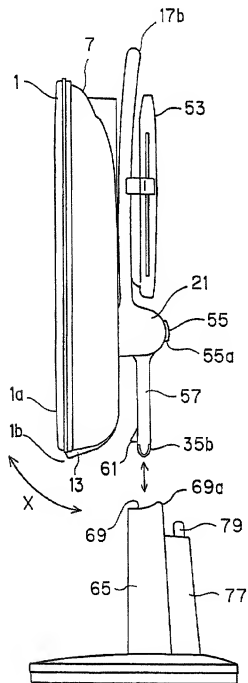
[Fig. 17]



[Fig. 18]

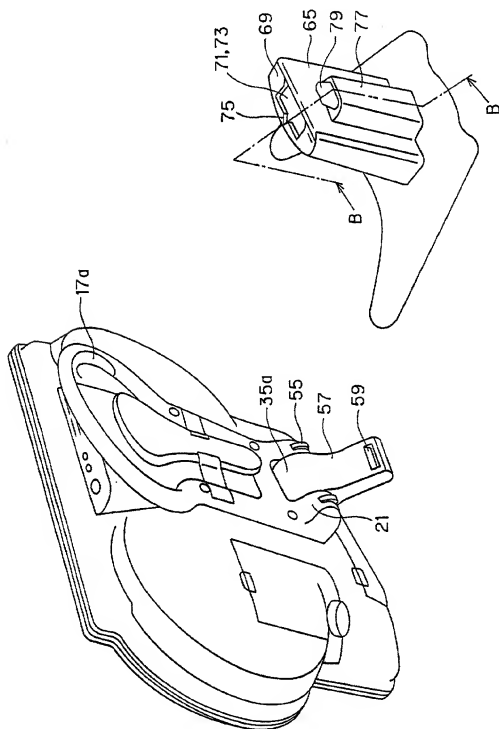


[Fig. 19]



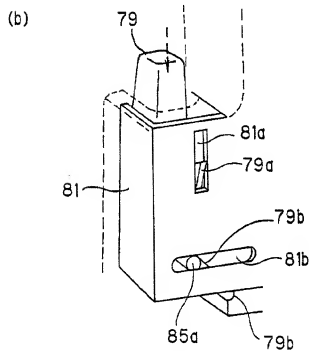
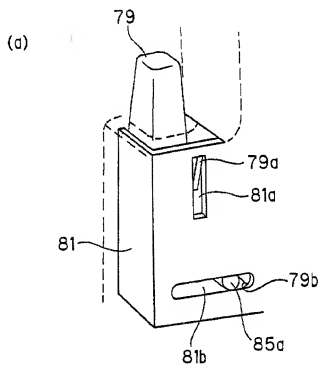


[Fig. 20]

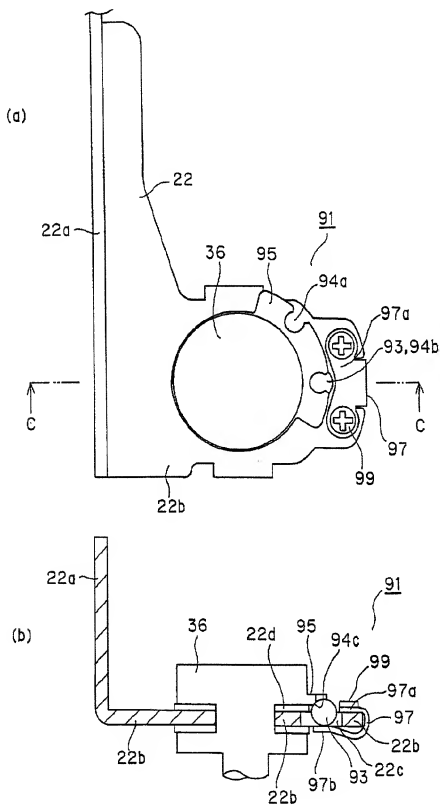




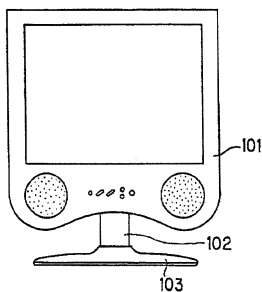
[Fig. 22]



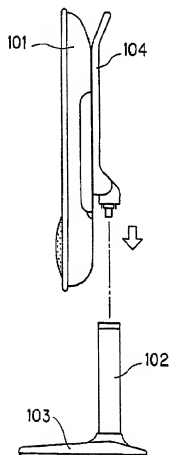
[Fig. 23]



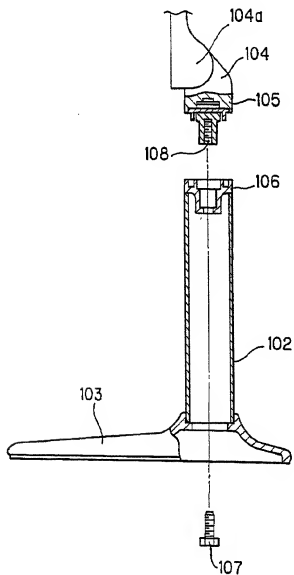
[Fig. 24]



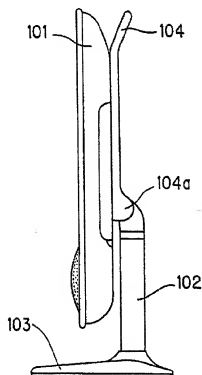
[Fig. 25]



[Fig. 26]



[Fig. 27]



[NAME OF DOCUMENT]    ABSTRACT

[ABSTRACT]

[PROBLEM] It is to provide a display monitor, such as a thin  
design television or the like, in which its display unit is  
5      easily attachable and detachable from the stand structure  
and can be easily carried about, and where the place of  
installation of the display unit is not limited.

[MEANS FOR SOLUTION] A stand type thin design television  
includes a display unit 1, a joint body 15, a pillar 25 and  
10      a stand base 29. The joint body 15 is attached to the display  
unit 1 while the joint body 15 is free to be attached to and  
removed from the pillar 25 that is fixed to the stand base  
29. In the first usage mode in which the pillar 25 and the  
stand base 29 are used, the joint 15 is inserted into the  
15      pillar 25. In the second usage mode in which the pillar 25  
and the stand base 29 are not used, the joint body 15 itself  
is used as a stand.

[SELECTED DRAWING]      FIG. 2